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What is claimed is:

A golf ball, comprising: 1.

a solid core having a PGA compression of 55 or less, and an outer cover layer having a Shore D hardness of at least 58, the ball having a PGA compression of 80 or less.

- A golf ball according to claim 1, wherein the outer cover 2. layer has a Shore D hardness of at least 63.
- A golf ball according to claim 1, wherein the ball has a PGA compression of 70 or less.
- A golf ball according to claim 1, wherein the ball has a diameter of no more than 1.70 inches.
- A golf ball according to claim 1, wherein the ball has a coefficient of restitution of at least 0.780.
- A golf ball according to claim 1, wherein the ball has a coefficient of restitution of at least 0.790.
- A golf ball according to claim 1, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 3100 Hz or less after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- A golf ball according to claim 1, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 1800 - 3100 Hz after the ball has been

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maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.

- 9. A golf ball according to claim 1, wherein the outer cover layer comprises ionomer.
- 5 10. A golf ball according to claim 2, wherein the ball has a PGA compression of 70 or less.
 - 11. A golf ball according to claim 2, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 3100 Hz or less after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
 - 12. A golf ball according to claim 2, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 100 3100 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
 - 13. A golf ball according to claim 3, wherein the ball has a coefficient of restitution of at least 0.790.
- 14. A golf ball according to claim 3, wherein the ball has a 20 mechanical impedance with a primary minimum value in the frequency range of 100 3100 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 15. A golf ball according to claim 3, wherein the ball has a 25 mechanical impedance with a primary minimum value in the frequency range of 1800-2600 Hz after the ball has been

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maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.

- 16. A golf ball according to claim 10, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 1800-3100 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 17. A golf ball according to claim 4, wherein the ball has a PGA compression of 70 or less and the outer cover layer has a Shore D hardness of at least 63.
- 18. A golf ball according to claim 17, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 100 3100 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 19. A golf ball according to claim 1, wherein the outer cover layer comprises at least 50 weight % of an ionomeric resin which is formed from an acid copolymer with a melt index of 30 g/10 min. (ASTM D 1238E) or less prior to neutralization with metal ions.
- 20. A golf ball according to claim 2, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 1800 2600 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 21. A golf ball according to claim 9, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 1800 2600 Hz or less after the ball has been

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maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.

22. A golf ball, comprising:

a solid core, and

5 an outer cover layer having a Shore D hardness of at least 58,

the ball having a mechanical impedance with a primary minimum value in the frequency range of 3100 Hz or less after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.

- 23. A golf ball according to claim 22, wherein the core has a PGA compression of 55 or less.
- 24. A golf ball according to claim 22, wherein the ball has a PGA compression of 80 or less.
- 25. A golf ball according to claim 22, wherein the ball has a mechanical impedance with primary minimum value in the frequency range of 1800-3100 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 26. A golf ball according to claim 22, wherein the ball has a 20 mechanical impedance with a primary minimum value in the frequency range of 1800-2600 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 27. A golf ball according to claim 22, wherein the outer cover layer comprises at least 50 weight % of an ionomeric resin which is

formed from an acid copolymer with a melt index of 30 g/10 min. (ASTM D 1238E) or less prior to neutralization with metal ions.

- 28. A golf ball according to claim 22, wherein the ball has a diameter of no more than 1.70 inches.
- 29. A golf ball, comprising: 5

a solid core having a PGA compression of 55 or less, and an outer cover layer with a Shore D hardness of at least 58,

the ball having a mechanical impedance with a primary minimum value in the frequency range of 3100 Hz or less after the ball has been maintained at 21.1°C, I atm. and about 50% relative humidity for at least 15 hours.

- 30. A golf ball according to claim 29, wherein the ball has a PGA compression of 80 or less.
- 31. A golf ball according to claim 29, wherein the outer cover layer has a Shore D hardness of at least 60.
- 32. A golf ball according to claim 29, wherein the ball has a coefficient of restitution of at least 0.780.
- 33. A golf ball according to claim 29, wherein the ball has a mechanical impedance with a primary minimum value in the frequency range of 1800-2600 Hz after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.
- 34. A golf ball according to claim 29, wherein the outer cover layer comprises at least 50 weight % of an ionomeric resin which is

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formed from an acid copolymer with a melt index of 30 g/10 min. (ASTM D 1238E) or less prior to neutralization with metal ions.

35. A golf ball according to claim 29, wherein the ball has a diameter of no more than 1.70 inches.

36. A golf ball, comprising:

a core, and

an outer cover layer having a Shore D hardness of at least 58,

the ball having a mechanical impedance with a primary minimum value in the frequency range of 2600 Hz or less after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.

37. A golf ball, comprising:

a core having a PGA compression of 55 or less, and an outer cover layer with a Shore D hardness of at least 58,

the ball having a mechanical impedance with a primary minimum value in the frequency range of 2600 Hz or less after the ball has been maintained at 21.1°C, 1 atm. and about 50% relative humidity for at least 15 hours.